

Frontiers in Pharmacology, 2018, vol.9, NJUN

Impairing of Serotonin synthesis by P-Chlorophenylalanine prevents the forgetting of contextual memory after reminder and the protein synthesis inhibition

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Abstract

© 2018 Deryabina, Muranova, Andrianov and Gainutdinov. HIGHLIGHTS • The injection of p-chlorophenylalanine, specific blocker of 5-HT synthesis 3 days before reminder with anisomycin administration prevented forgetting. It is known that the reminder cause reactivation of the long-term memory and it leads to reconsolidation of memory. We showed earlier that the disruption of the reconsolidation of contextual memory in terrestrial snail was caused by anisomycin, the inhibitor of protein syntheses (Gainutdinova et al., 2005; Balaban et al., 2014). In this paper we investigated the possible changes of the memory reconsolidation under the conditions of serotonin deficit, caused by administration of p-chlorophenylalanine, the inhibitor of tryptophan hydroxylase synthesis (intermediate stage of the synthesis of serotonin). It was shown that the forgetting process for contextual memory after reminder and inhibition of protein synthesis did not occur if the serotonin transmission in nervous system was impaired. This effect was significantly different from the direct action of anisomycin, which blocked the reconsolidation of contextual memory. We concluded that the serotonin system was included to the process of memory reconsolidation.

<http://dx.doi.org/10.3389/fphar.2018.00607>

Keywords

Anisomycin (AN), Consolidation, Contextual memory, P-CPA, Reconsolidation, Serotonin (5-HT), Snail

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